AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

IN THE CLAIMS:

1. (Currently Amended) A lead-substitute radiation protection apron for radiation protection against radiation resulting from an X-ray tube having a voltage of from 60 to 140 kV, said protection apron comprising at least a first and a second protective layer of different compositions ~~which~~ that are separate or joined together, wherein said first protective layer comprises predominantly atomic elements of a first atomic number and said second protective layer comprises predominantly atomic elements of a second atomic number, wherein said first atomic number is lower than said second atomic number; wherein the protection apron possesses design features which, when worn by a wearer, constrain the wearer to wear the protection apron in such a manner that the first protective layer is ~~designed to be located on a part of the apron~~ farther away than the second protective layer from a skin layer of [[a]]said wearer ~~when worn by a wearer~~, ~~and said second protective layer comprises predominantly atomic elements of a second atomic number and is designed to be located on a part of the apron closer than the first protective layer to the skin layer of the wearer when worn by the wearer,~~ ~~wherein said first atomic number is lower than said second atomic number,~~ and, wherein, for nominal overall lead equivalents of from 0.25 to 2.0 mm, the ~~lead substitute material comprises~~ first and second protective layers are independently comprised of:

from 12 to 22 wt. % matrix material,

from 0 to 75 wt. % Sn or Sn compounds,

from 0 to 73 wt. % W or W compounds, and

from 0 to 80 wt. % Bi or Bi compounds, and

wherein not more than one of the constituents is 0 wt. %.

2. (Currently Amended) The radiation protection apron according to claim 1, wherein the ~~lead substitute material comprises~~ first and second protective layers are independently comprised of:

from 12 to 22 wt. % matrix material,

from 0 to 39 wt. % Sn or Sn compounds,

from 0 to 60 wt. % W or W compounds, and

from 0 to 60 wt. % Bi or Bi compounds

wherein not more than one of the constituents is 0 wt. %.

3. (Currently Amended) The radiation protection apron according to claim 2, wherein the ~~lead substitute material comprises~~ first and second protective layers are independently comprised of:

from 12 to 22 wt. % matrix material,

from 0 to 39 wt. % Sn or Sn compounds,

from 16 to 60 wt. % W or W compounds and

from 16 to 60 wt. % Bi or Bi compounds.

4. (Currently Amended) The radiation protection apron according to claim 1, wherein the ~~lead substitute material comprises~~ first and second protective layers are independently comprised of:

from 12 to 22 wt. % matrix material,

from 40 to 60 wt. % Sn or Sn compounds,

from 7 to 15 wt. % W or W compounds and

from 7 to 15 wt. % Bi or Bi compounds.

5. (Currently Amended) The radiation protection apron according to claim 1, wherein at least one of the ~~lead substitute material~~ first and second protective layers is additionally ~~comprises~~ comprised of up to 40 wt. % of one or more [[of]]components selected from Er, Ho, Dy, Tb, Gd, Eu, Sm, La, Ce, Nd, Cs, Ba, I, Pr, ~~their~~ and compounds thereof~~, and CsI~~.

6. (Currently Amended) The radiation protection apron according to claim 5, wherein at least one of the ~~lead substitute material~~ first and second protective layers is additionally ~~comprises~~ comprised of up to 20 wt. % of one or more [[of]]components selected from Er, Ho, Dy, Tb, Gd, Eu, Sm, La, Ce, Nd, Cs, Ba, I, Pr, ~~their~~ and compounds thereof~~, and CsI~~.

7. (Currently Amended) The radiation protection apron according to claim 6, wherein at least one of the ~~lead substitute material~~ first and second protective layers is additionally

~~comprises~~ comprised of up to 8 wt. % of one or more [[of]]components selected from Er, Ho, Dy, Tb, Gd, Eu, Sm, La, Ce, Nd, Cs, Ba, I, Pr, ~~their~~ and compounds thereof~~, and CsI~~.

8. (Currently Amended) The radiation protection apron according to claim 1, wherein at least one of the ~~lead-substitute material~~ first and second protective layers is additionally ~~comprises~~ comprised of up to 40 wt. % of one or more [[of]]components selected from Ta, Hf, Lu, Yb, Tm, Th, U and ~~their~~ compounds thereof.

9. (Currently Amended) The radiation protection apron according to claim 1, wherein at least one of the ~~lead-substitute material~~ first and second protective layers is additionally ~~comprises~~ comprised of up to 20 wt. % of one or more [[of]]components selected from Ta, Hf, Lu, Yb, Tm, Th, U and ~~their~~ compounds thereof.

10. (Currently Amended) The radiation protection apron according to claim 1, wherein at least one of the ~~lead-substitute material~~ first and second protective layers is additionally ~~comprises~~ comprised of up to 8 wt. % of one or more [[of]]components selected from Ta, Hf, Lu, Yb, Tm, Th, U and ~~their~~ compounds thereof.

11. (Currently Amended) A lead-substitute radiation protection apron for radiation protection against radiation resulting from an X-ray tube having a voltage of from 60 to 90 kV according to claim 5, wherein, for nominal overall lead equivalents of from 0.25 to 0.6 mm, the ~~lead-substitute material comprises~~ first and second protective layers are independently comprised of:

from 12 to 22 wt. % matrix material,

from 49 to 65 wt. % Sn or Sn compounds,

from 0 to 20 wt. % W or W compounds,

from 0 to 20 wt. % Bi or Bi compounds and

from 2 to 35 wt. % of one or more [[of]]components selected from Gd, Eu, Sm, La, Ce, Nd, Cs, Ba, I, Pr, ~~their~~ and compounds thereof~~, and CsI~~.

12. (Currently Amended) A lead-substitute radiation protection apron according to claim 11, wherein at least one of the ~~lead-substitute material~~ first and second protective layers is

additionally ~~comprises~~ comprised of from 2 to 25 wt. % of one or more components selected from I, Cs, Ba, La, Ce, Pr, ~~and/or~~ Nd, ~~and/or their~~ and compounds thereof ~~and/or CsI~~.

13. (Currently Amended) A lead-substitute radiation protection apron ~~for radiation protection against radiation resulting from an X-ray tube having a voltage of from 100 to 140 kV~~ according to claim 5, wherein, for nominal overall lead equivalents of from 0.25 to 0.6 mm, the ~~lead-substitute material comprises~~ first and second protective layers are independently comprised of:

from 12 to 22 wt. % matrix material,

from 40 to 73 wt. % Bi and/or W or their compounds and

from 5 to 38 wt. % of one or more of Gd, Eu, Er, Hf and their compounds.

14.-15. (Cancelled)

16. (Currently Amended) A lead-substitute radiation protection apron according to claim 1, wherein the protection apron comprises a structure of at least two protective layers of different compositions ~~which~~ that are separate or joined together, wherein, at least in one layer, at least 50% of the total weight ~~consists of only~~ is attributed to one of Sn, W, and Bi, or a compound thereof.

17. (Currently Amended) A lead-substitute radiation protection apron according to claim 1, wherein, at least in one layer, ~~of the radiation protection apron at least 50% of the total weight consists only of~~ at least 40 wt. % of the total weight is attributed to Sn or its compounds and at least 10 wt. % of the total weight is attributed to one of I, Cs, Ba, La, Ce, Pr, ~~and/or~~ Nd, and ~~and/or their~~ compounds thereof ~~and/or CsI~~.

18. (Previously Presented) A lead-substitute radiation protection apron according to claim 1, wherein the protective layer(s) designed to be farther from the skin layer of the wearer comprise(s) predominantly elements or their compounds having a higher X-ray fluorescent yield, and the protective layer(s) designed to be closer to the skin layer of a wearer comprise(s) elements or their compounds having a lower X-ray fluorescent yield.

19. (Previously Presented) A lead-substitute radiation protection apron according to claim 1, wherein the protective apron comprises a structure of at least three protective layers of different compositions which are separate or joined together, wherein the protective layer(s) more remote from the body and the protective layer(s) close to the body comprise predominantly the elements having a higher atomic number or their compounds, and there is arranged in the middle at least one protective layer comprising predominantly elements having a lower atomic number.

20. (Previously Presented) A lead-substitute radiation protection apron according to claim 1, wherein a weakly radioactive layer is embedded between two non-radioactive protective layers which are separate from or joined to the radioactive layer.

21. (Previously Presented) A lead-substitute radiation protection apron according to claim 1, comprising metals or metal compounds that are granular and have particle sizes that exhibit a 50^{th} percentile according to the following formula

$$D_{50} = \frac{d \cdot p}{10} mm$$

wherein

D_{50} represents the 50^{th} percentile of the particular size distribution,

d represents the layer thickness in mm and

p represents the proportion by weight of the particle material component in the total weight,

and the 90^{th} percentile of the particle size distribution $D_{90} \leq 2 \cdot D_{50}$.

22. (Cancelled)

23. (Withdrawn) A method of protecting a body from radiation by using a lead substitute material for radiation protection purposes in the energy range of an X-ray tube having a voltage of from 60 to 140 kV, comprising a structure of at least two protective layers of different compositions which are separate or joined together, wherein for nominal overall lead equivalents of from 0.25 to 2.0 mm the lead substitute material comprises

from 12 to 22 wt. % matrix material,

up to 75 wt. % Sn or Sn compounds,

up to 73 wt. % W or W compounds, and

up to 80 wt. % Bi or Bi compounds,

characterized in that the protective layer(s) more remote from the body being protected comprise(s) predominantly the elements having a lower atomic number, or their compounds, and the protective layer(s) close to the body being protected comprise(s) predominantly the elements having a higher atomic number, or their compounds.

24. (Withdrawn) The method of protecting a body from radiation according to claim 23, characterised in that

the lead substitute material comprises

from 12 to 22 wt. % matrix material,

up to 39 wt. % Sn or Sn compounds,

up to 60 wt. % W or W compounds, and

up to 60 wt. % Bi or Bi compounds.

25. (Withdrawn) The method of protecting a body from radiation according to claim 23, characterised in that the lead substitute material additionally comprises up to 40 wt. % of one or more of the following elements:

Er, Ho, Dy, Tb, Gd, Eu, Sm, La, Ce, Nd, Cs, Ba, I, Pr and/or their compounds and/or CsI.

26. (Withdrawn) The method of protecting a body from radiation according to claim 23, characterised in that the lead substitute material additionally comprises up to 40 wt. % of one or more of the following elements:

Ta, Hf, Lu, Yb, Tm, Th, U and/or their compounds.

27. (Withdrawn) The method of protecting a body from radiation according to claim 25, for radiation protection purposes in the energy range of an X-ray tube having a voltage of from 60 to 90 kV, characterised in that for nominal overall lead equivalents of from 0.25 to 0.6 mm the lead substitute material comprises

from 12 to 22 wt. % matrix material,

from 49 to 65 wt. % Sn or Sn compounds,

up to 20 wt. % W or W compounds,

up to 20 wt. % Bi or Bi compounds and

from 2 to 35 wt. % of one or more of the elements Gd,

Eu, Sm, La, Ce, Nd, Cs, Ba, I, Pr and/or their compounds and/or CsI.

28. (Withdrawn) The method of protecting a body from radiation according to claim 23, characterised in that it comprises a structure of at least two protective layers of different compositions which are separate or joined together, wherein at least in one layer at least 50% of the total weight consists of only one element from the group Sn, W and Bi or their compounds.

29. (Withdrawn) The method of protecting a body from radiation according to claim 23, characterised in that it comprises a structure of at least two protective layers of different compositions which are separate or joined together, wherein the protective layer(s) more remote from the body comprise(s) predominantly the elements or their compounds having a higher X-ray fluorescent yield, and the protective layer(s) close to the body comprise(s) the elements or their compounds having a lower X-ray fluorescent yield.

30. (Withdrawn) The method of protecting a body from radiation according to claim 23, characterised in that it comprises a structure of at least three protective layers of different compositions which are separate or joined together, wherein the protective layer(s) more remote from the body and the protective layer(s) close to the body comprise predominantly the elements having a higher atomic number or their compounds, and there is arranged in the middle at least one protective layer comprising predominantly elements having a lower atomic number.

31. (Withdrawn) The method of protecting a body from radiation according to claim 23, characterised in that the metals or metal compounds are granular and their particle sizes exhibit a 50^{th} percentile according to the following formula

$$D_{50} = \frac{d \cdot p}{10} mm$$

wherein

D_{50} represents the 50^{th} percentile of the particular size distribution,

d represents the layer thickness in mm and

p represents the proportion by weight of the particle material component in the total weight,

and the 90^{th} percentile of the particle size distribution $D_{90} \leq 2 \cdot D_{50}$.